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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/913,280	03/04/2002	Karl J. Zeitsch	251713	7105

466 7590 03/25/2003

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EXAMINER

SACKEY, EBENEZER O

ART UNIT PAPER NUMBER

1626

DATE MAILED: 03/25/2003

10

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/913,280

Applicant(s)

ZEITSCH

Examiner

EBENEZER SACKEY

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Jan 29, 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on Oct 11, 2001 is/are a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 2 6) ☐ Other:

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DETAILED ACTION

This is a response to applicants election of Group I, claims 1-10, without traverse.

Applicants have canceled claims 11-13, reserving the right to file a divisional application during the pendency of the present application.

Claims 1-10 are present for examination.

Specification

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly,

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owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Objection to the Specification

On page 5 of the specification, the Title of the Drawings (Brief Description of the Drawings) should appear before the Description of the Invention. Additionally, chemical symbol on page 2, lines 6 and 12 may not be needed. Page 3, line 9, "pressurised" should be ---pressurized---; page 2, line 27, page 3, lines 11, 13; 16, 19, 21, 22 and 23; page 4, lines 5, 10, 17, 18, page 5, lines 25 and 27; page 6, lines 2 and 6 respectively, "depressurisation" should be --depressurization--; additionally, "realisation" line 10, should be --realization--; page 4, line 23, "computerised" should be -computerized--.

"Pressurized" and "depressurization" have also been misspelled in claims 1 and 3-7 respectively.

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Claim Rejections - 35 U.S.C. § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

2. Claims 9 and 10 recite the limitation "catalyst" in line 2, in each occurrence. The claims depend on claim 1 which does not define a catalyst as part of the invention. Therefore, there is no antecedent basis for "catalyst" in the claims.

Claims 1-10, line 1, in each claim, it is suggested that "characterized" be replaced by --comprising-- for clarity.

Claim Rejections - 35 U.S.C. § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having

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ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zietsch (U.S. Patent No. 4,912,237).

Applicants claim a process for manufacturing furfural wherein a reactor is charged with pentosan containing material, heating the charge by introducing pressurized steam to a first predetermined temperature through inlet valve (2), (fig 2) of the reactor, and subjecting the charge to a gradual reduction of pressure to a second predetermined temperature, wherein the depressurization rate is sufficient to maintain an ebullient liquid state in the reactor.

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Determination of the scope and content of the prior art (M.P.E.P., §2141.01)

Zietsch, '237' discloses a process for producing furfural which comprises: (a) passing a suspension comminuted pentosan containing raw material in dilute sulfuric acid through a reactor and mixing the suspension in the reactor with high-pressure steam to heat the suspension to between 170° to 230°C; (b) cooling the reacted suspension in a heat exchanger to between 140° to 200°C; c) thereafter passing the reacted suspension, cooled in the heat exchanger through a valve into an expansion evaporator maintained at a pressure of 760 Torr to separate a residual suspension phase containing furfural from a water/furfural mixed vapor phase; and (d) recover furfural from the vapor.

Ascertainment of the difference between the prior art and the claims (M.P.E.P., §2141.02)

The instant method differs from Zeitsch in that the reaction medium is maintained in a constant ebullient state and, phosphoric and acetic acids are used as catalyst for preparing furfural, whereas sulfuric acid is used by Zeitsch. Zeitsch is silent on whether the reaction medium is maintained in a constantly ebullient state. However, in column 5, lines 34-48, Zeitsch

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discloses that the injection of high pressure steam into the flow reactor increases the temperature of the reaction medium to a point just below the boiling point of the mixture. Thus, maintaining a reaction medium which is kept in an ebullient state is considered prima facie obvious in view of the disclosure of Zeitsch because it infers that the reaction conditions are similar. Claim 7 is drawn to the process wherein depressurization takes place in the temperature range between 280° and 150°C. Zeitsch is silent on depressurizing the reaction medium. Claim 8 is drawn to process temperatures of between 230° and 170°C. Zeitsch disclose process temperatures of between 170° and 230°C. See column 4, line 8

Finding of prima facie obviousness---rational and motivation (M.P.E.P.. §2142-2143)

Zeitsch discloses a reactor for producing furfural as note column 1 lines 26-52, and lines 65-68. The claimed features, i.e., feeding the mass material into the reactor, introducing pressurized steam to predetermined temperatures and depressurizing to a temperature sufficient to maintain a liquid phase would be obvious in view of the drawbacks of prior process which is the gating of solids into and out of the reactor. See column 1, lines 53-64, column 2, lines 60-68, column 3, lines 1-3.

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Accordingly, one of ordinary skill in the art would be motivated to optimize reaction conditions of the basic process of Zeitsch in order to avoid the formation of solids and thus, improve yield and selectivity. Additionally, the worker in the art would be motivated to optimize the process parameters such as gradual depressurization and temperature (as is done in the instant claims, e.g., 3, 4, 6, 7, 8 etc.) to improve product yield and selectivity absent a showing of unexpected results and/or properties.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to E. Sackey whose telephone number is (703) 305-6889. The examiner can normally be reached on Monday-Friday from 7:30 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph K. McKane, can be reached on (703) 308-4537. The fax phone number for this Group is (703) 308-4556.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-1235.

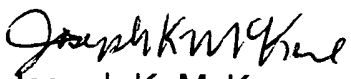
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March 24, 2003


Joseph K. McKane

Supervisory Patent Examiner

Art Unit 1626, Group 1600

Technology Center 1